

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

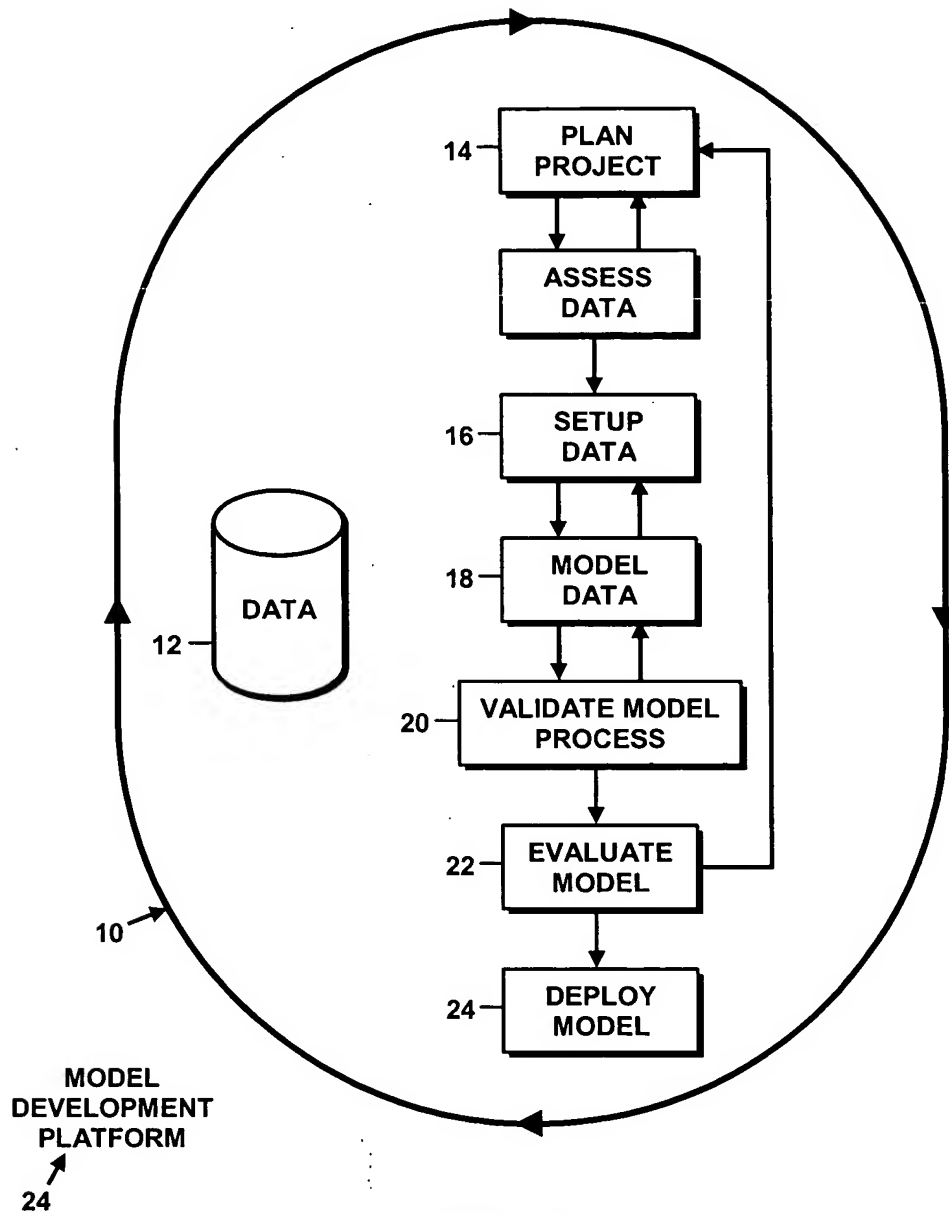
Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

**FIG. 1**

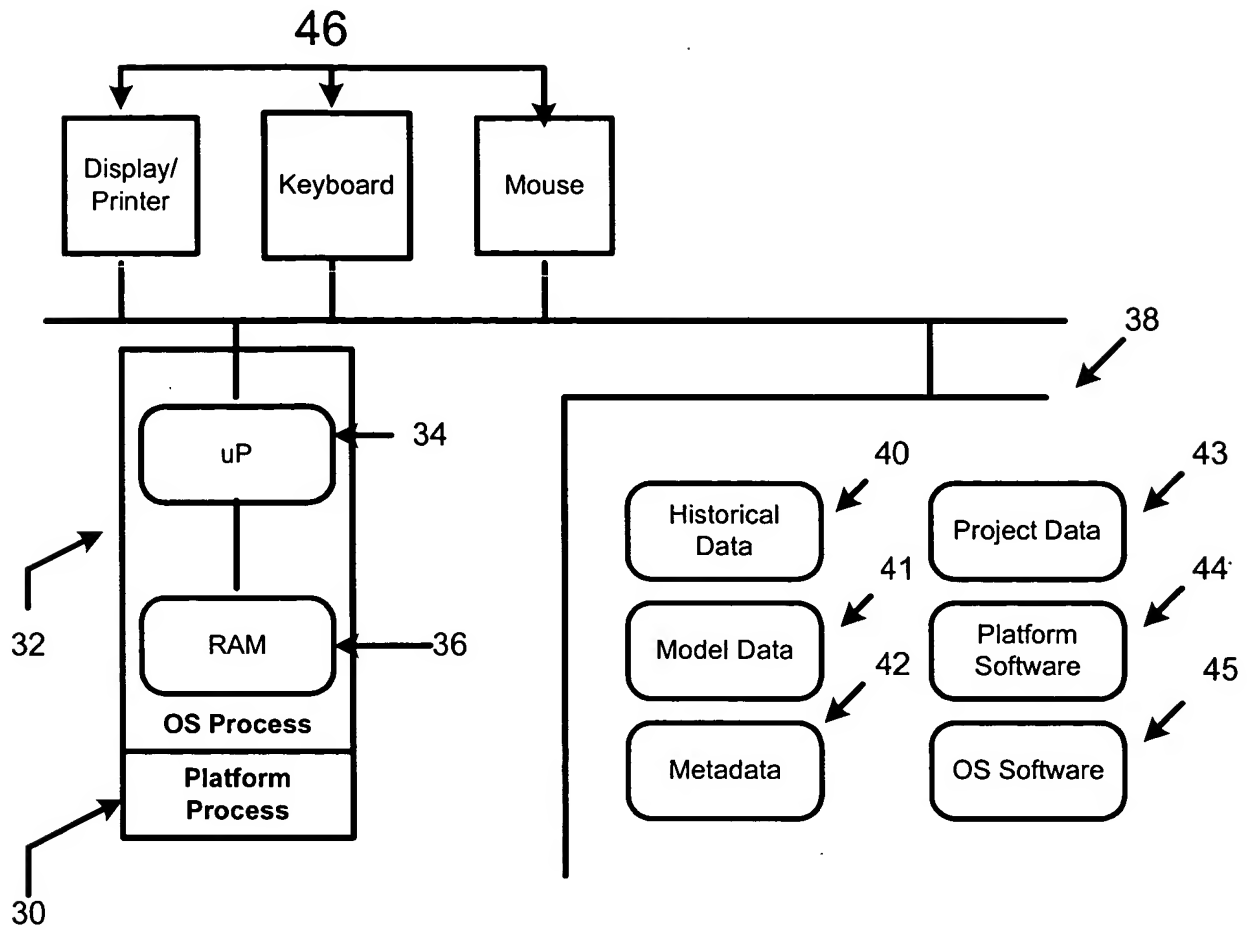


FIGURE 2

Applicant(s): Stephen K. Pinto et al.

DIMENSION REDUCTION IN PREDICTIVE MODEL DEVELOPMENT

50

52

54

56

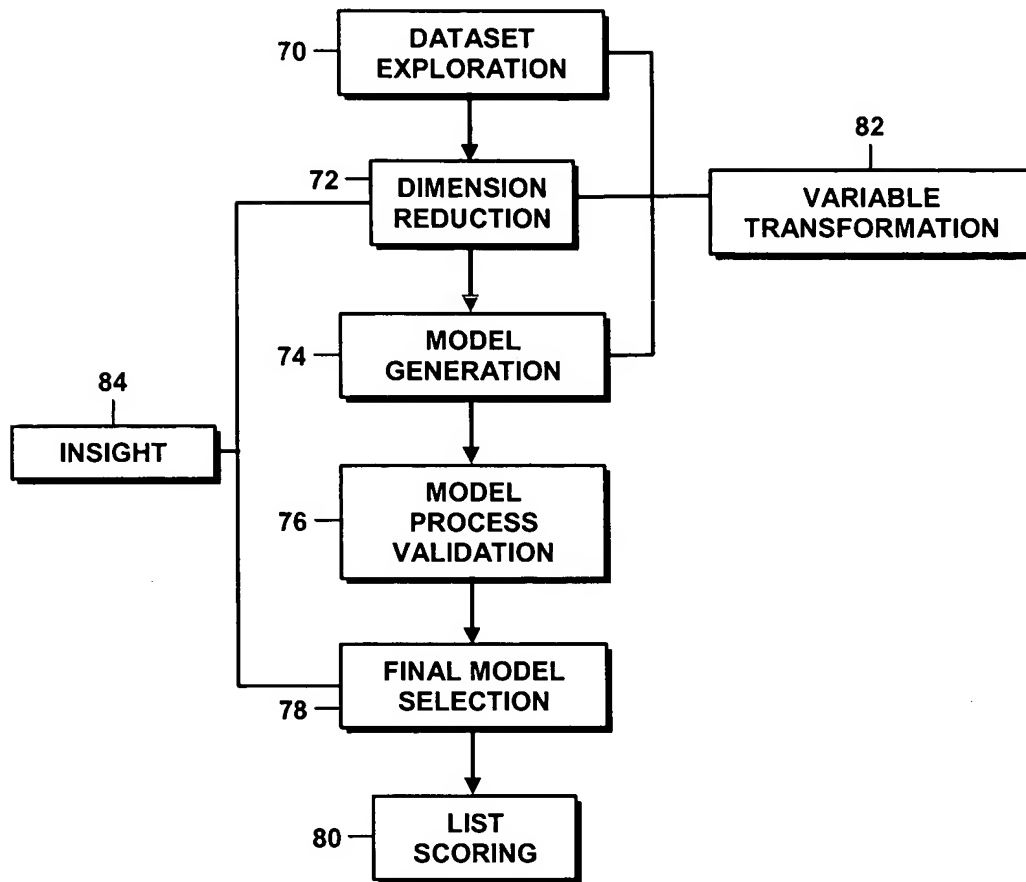
58

60

62

Field Name	Data Type	Description
ProjectID	AutoNumber	Unique Number Indexing Model Projects
ProjectName	Text	Reference Name for Model Project
ProjectType	Text	Type of Model to be constructed (Response, Clone, Suppression,)
ProjectGoal	Text	Analyst-defined goal for current Model Project
ProjectBeginDate	Date/Time	Identifying Time Stamp for first use
ProjectEndDate	Date/Time	Last used Time Stamp
ProjectDataset	Text	Full pathname reference to Development dataset
ProjectDataDictionary	Text	Full pathname reference to metadata and Model status and data
ProjectLog	Text	Full pathname reference to log of Analyst decisions
DependentVariable	Text	Target variable selected for Model
ModelFitnessCriterion	Number	Desired c-index for Model set by Analyst
ModelPerformanceCriterion	Number	Desired zone of positive Model Gain set by Client
ModelPerformanceMonotonicityCriterion	Number	Desired level of Monotonicity
DevelopmentDatasetSize	Number	Total number of records in Development Dataset
PositiveOutcomes(%)	Number	Number of successful outcomes as a percent of Development Dataset Size
SampleSize(%)	Number	Size of Training Sample as a percent of total Development Dataset Size used for Candidate Model
VariableCount	Number	Initial Number of Predictor Variables
SampleDistribution	Hyperlink	Distribution of Predictor Variables: Graphs and Statistics
SampleByDistribution	Hyperlink	Distribution of Predictor Variables for Positive and Negative Outcomes
Interaction Tree	Hyperlink	Cross-validated Partition Tree for Key Predictor Variables
DimensionReductionMissingFilter	Number	Number of Predictor Variables Eliminated for Missing Variables
DimensionReductionCutoff	Number	Cutoff set by Analyst for Percent of Missing Values Acceptable
DimensionReductionMainEffects	Number	Number of Predictor Variables Retained for Main Effects
DimensionReductionMainEffectsCutoff	Number	Cutoff set by Analyst for Significance of Main Effects
DimensionReductionInteractionEffects	Number	Number of Predictor Variables Retained for Interaction Effects
DimensionReductionInteractionEffectsCutoff	Number	Cutoff set by Analyst for Significance of Interaction Effects
DimensionReductionVariableCount	Number	Number of Predictor Variables resulting from Dimension Reduction
CandidateModelChoice	Text	Model Type applied to Dimension Reduced Dataset
CandidateModelChoiceConstraint	Number	Retention Cutoff or Significance Level for Model Variables
CandidateModelResults	Hyperlink	Model Fitting Results
CandidateModelLiftChart	Hyperlink	Model Non-cumulative Lift Chart
CandidateModelPersistenceChart	Hyperlink	Model Persistence Chart for Key Variables
ValidationMethod	Text	Method Selected for Model Development Process Validation
ValidationMethodResults	Hyperlink	Model Application to Validation Dataset(s) Results
ValidationMethodLiftChart	Hyperlink	Model Validation Lift Chart
FinalModelResults	Hyperlink	Model Development Process applied to full Development Dataset Results
FinalModelLiftChartComparison	Hyperlink	Final Model applied to Sample and Validation Datasets for Cumulative Lift
FinalModelNonCumulativeLiftChartComparison	Hyperlink	Final Model applied to Sample and Validation Datasets for Non-cumulative Lift
FinalModelEquation	Text	Model Parameterized Equation using Model Transformed Variables
ScoringDataset	Text	Full pathname reference to Scoring File Input Dataset
DevelopmentScoringComparison	Hyperlink	Key Variable Comparison on Decile Basis
DevelopmentScoringDistributionComparison	Hyperlink	Propensity Score Distribution for Development and Scoring File (Subset)
ScoringResults	Text	Full pathname reference to Scoring File Output Dataset
InsightProfileMethod	Text	Method for Ranking Customer Insight Variables
InsightProfile	Hyperlink	Ranked List of Key Variables
InsightProfileChart	Hyperlink	Insight Chart of Key Variable Differential Contribution
FinalReportEntry	Memo	Final Report Description and Comments

FIGURE 3

**FIG. 4**

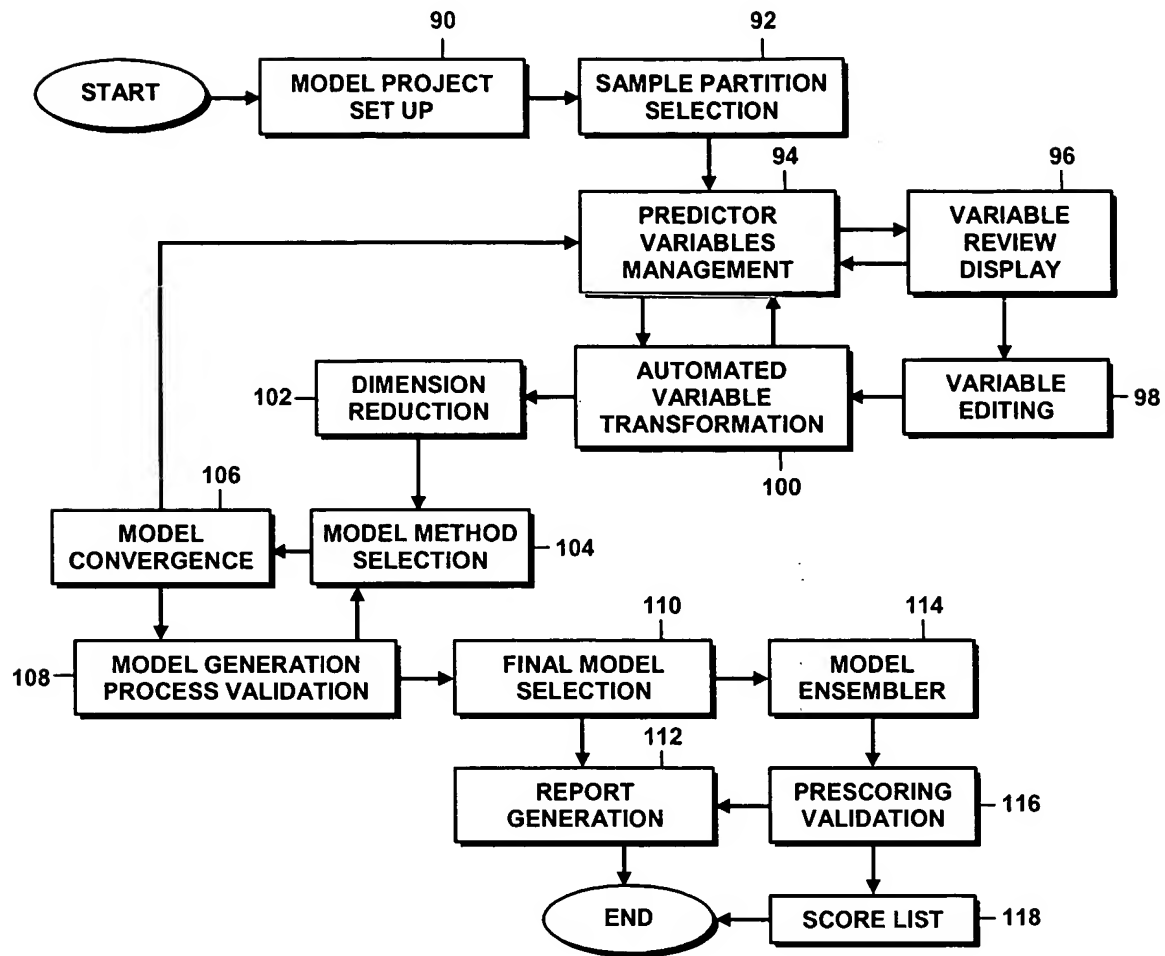
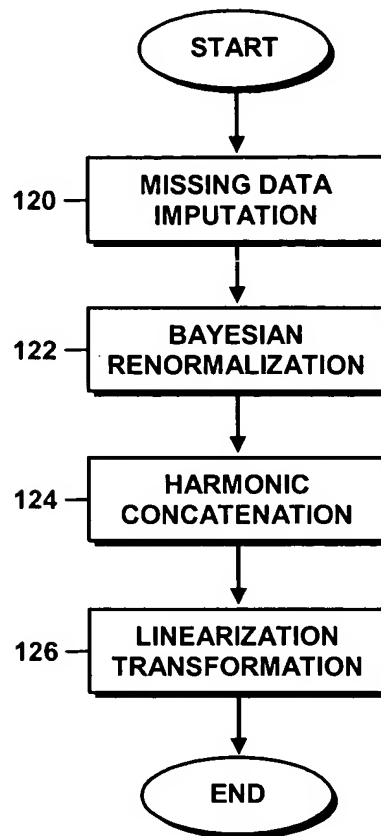


FIG. 5

**FIG. 6**

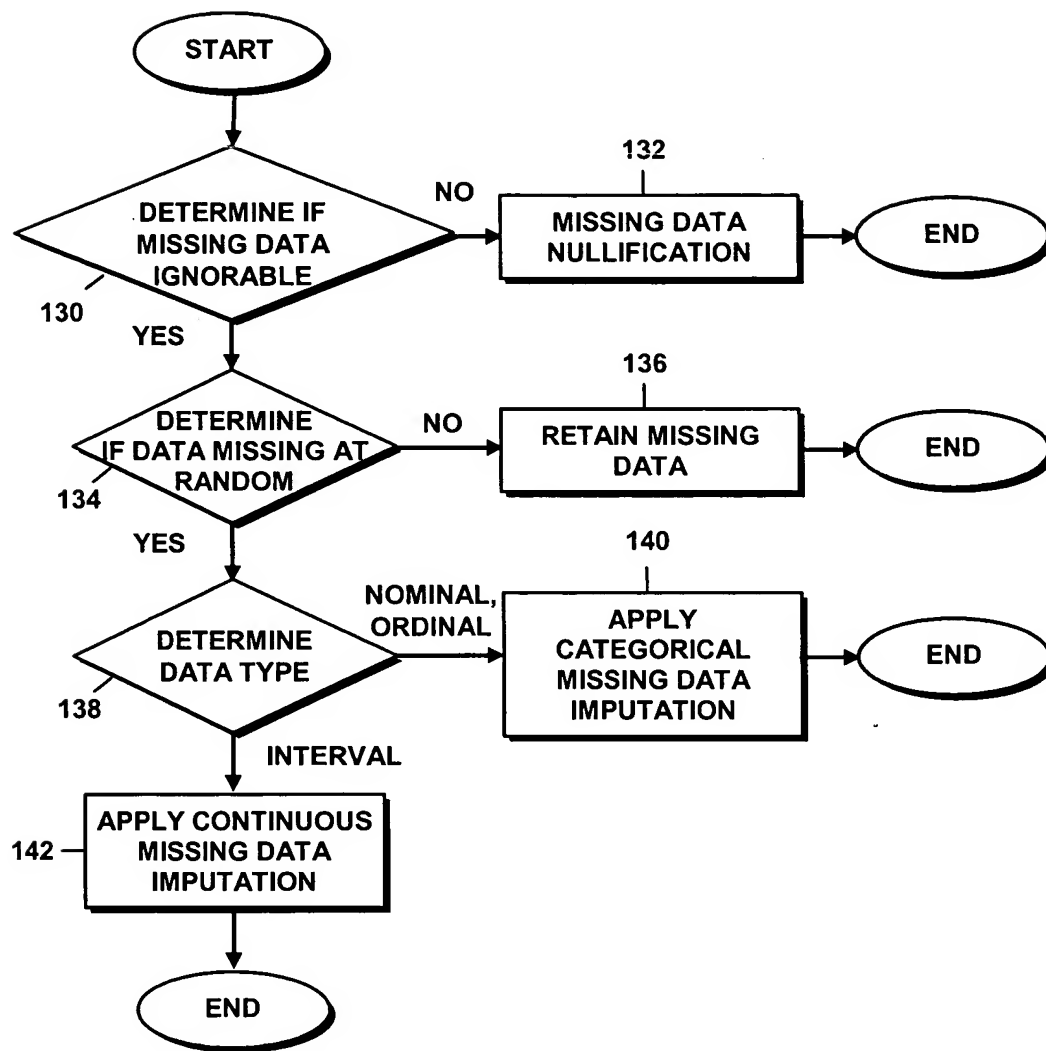
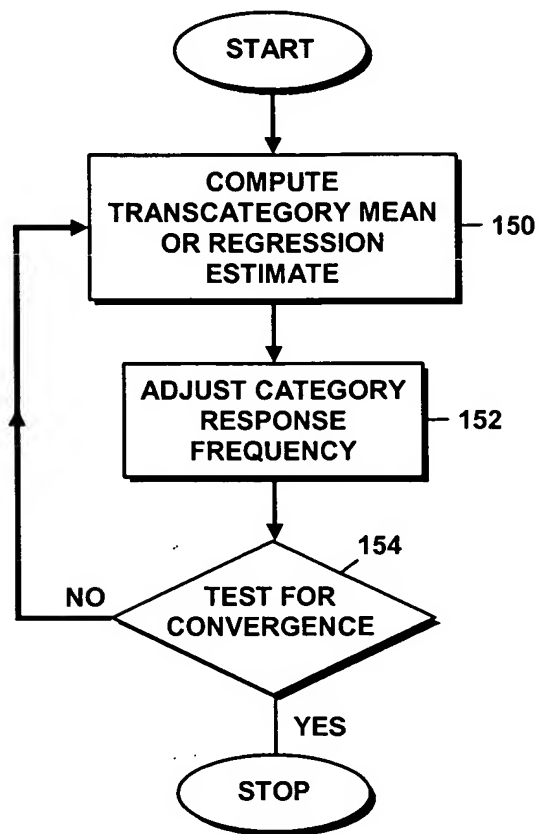
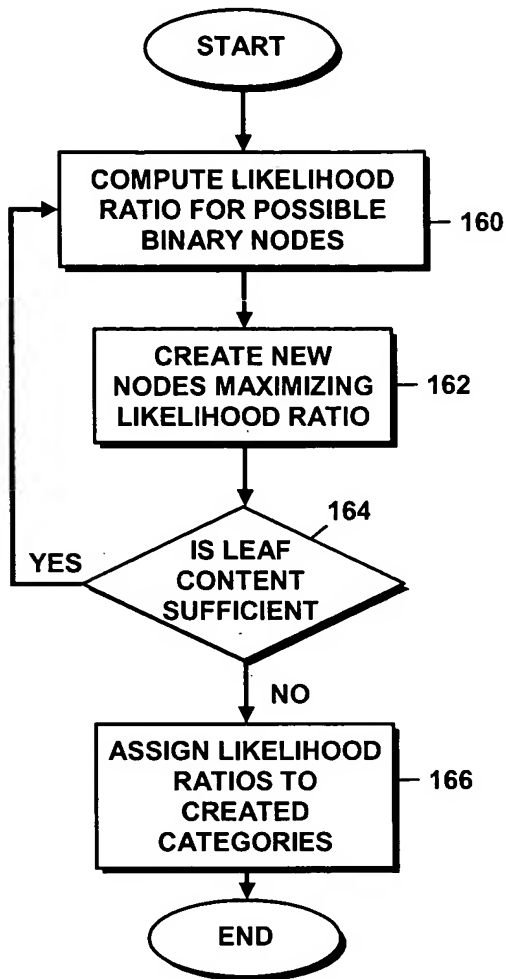
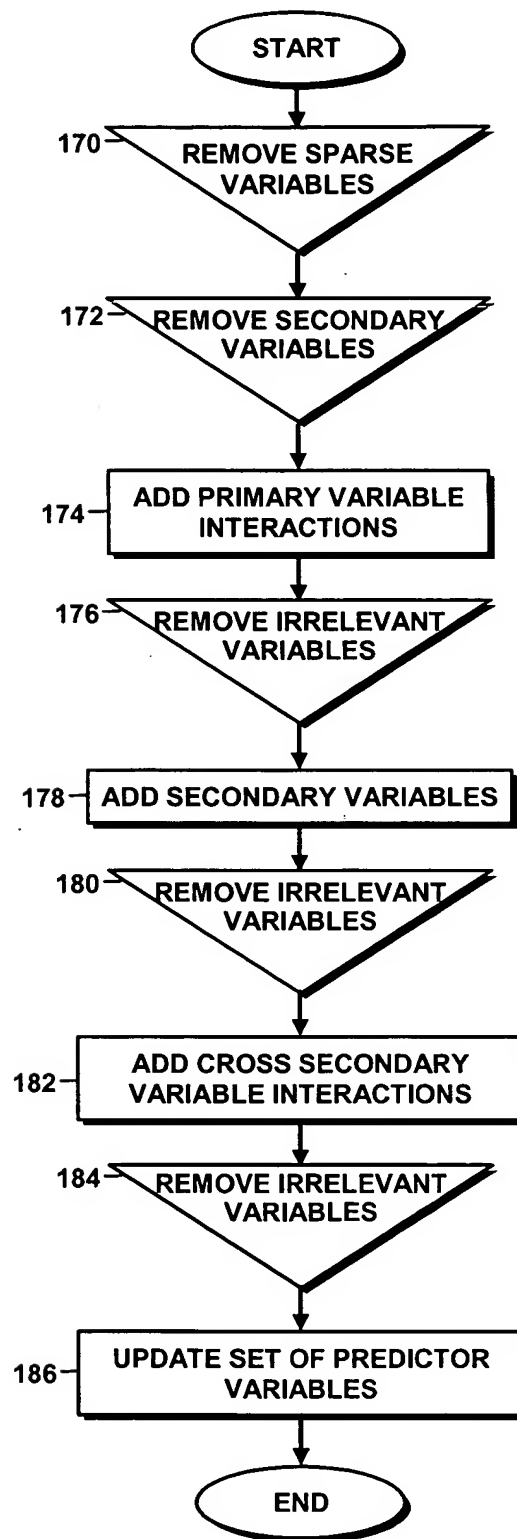


FIG. 7

**FIG. 8**

**FIG. 9**

**FIG. 10**

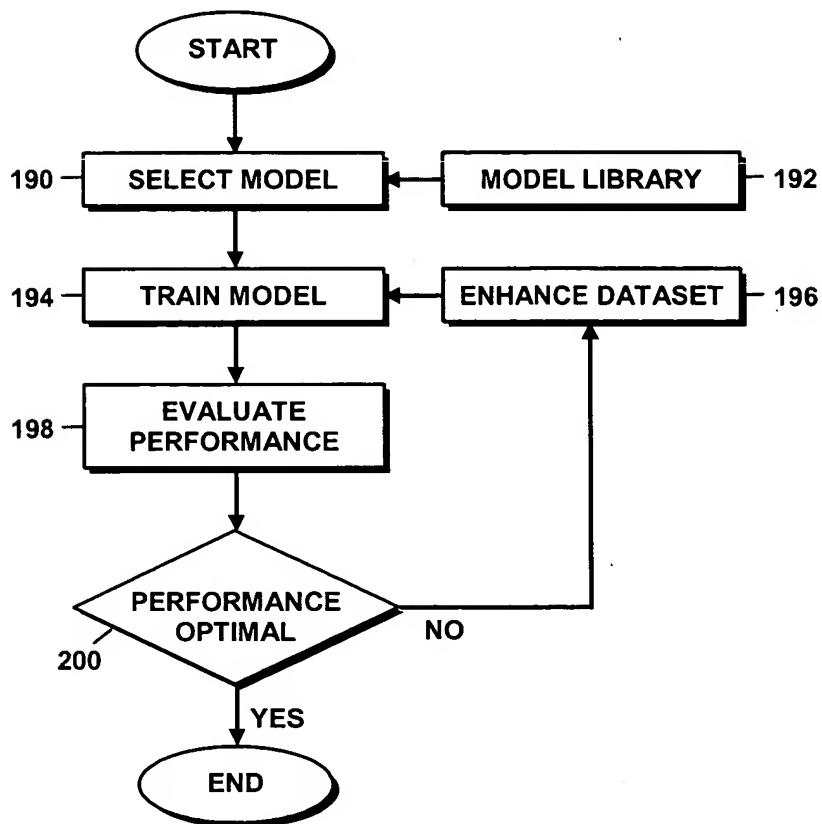
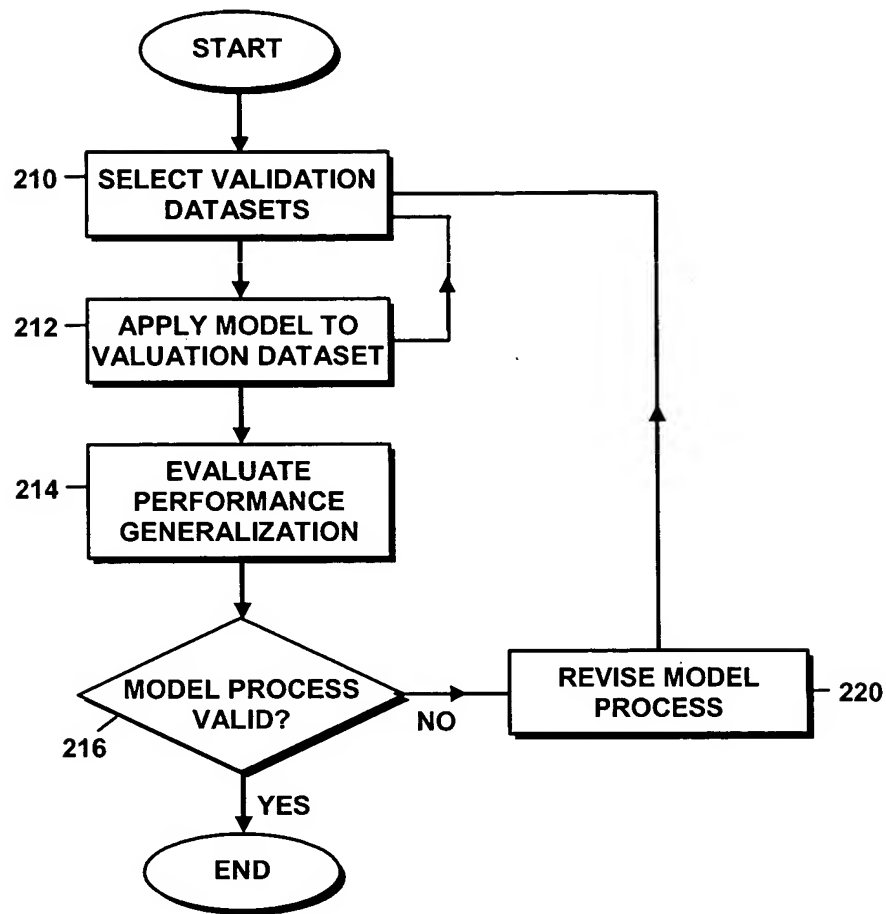
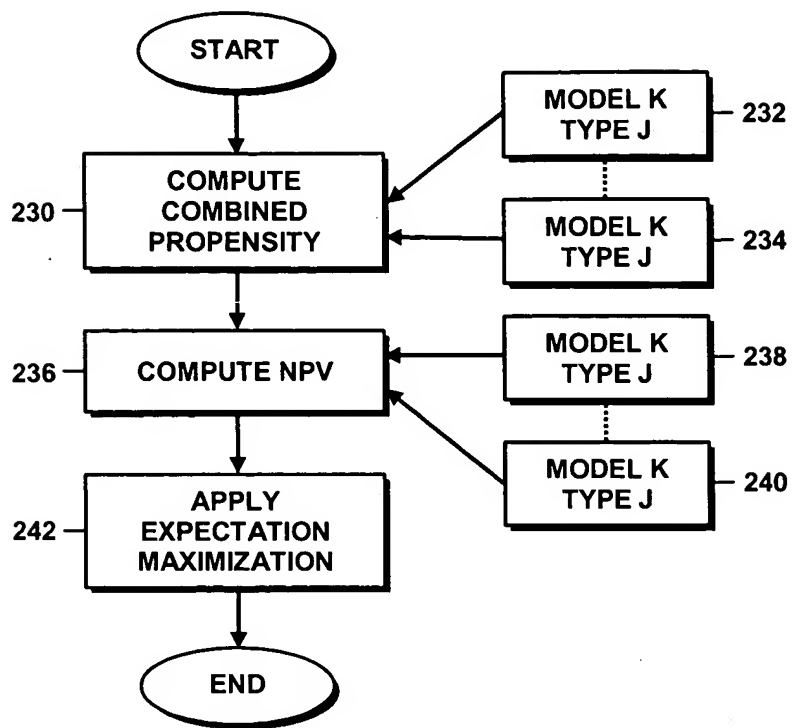
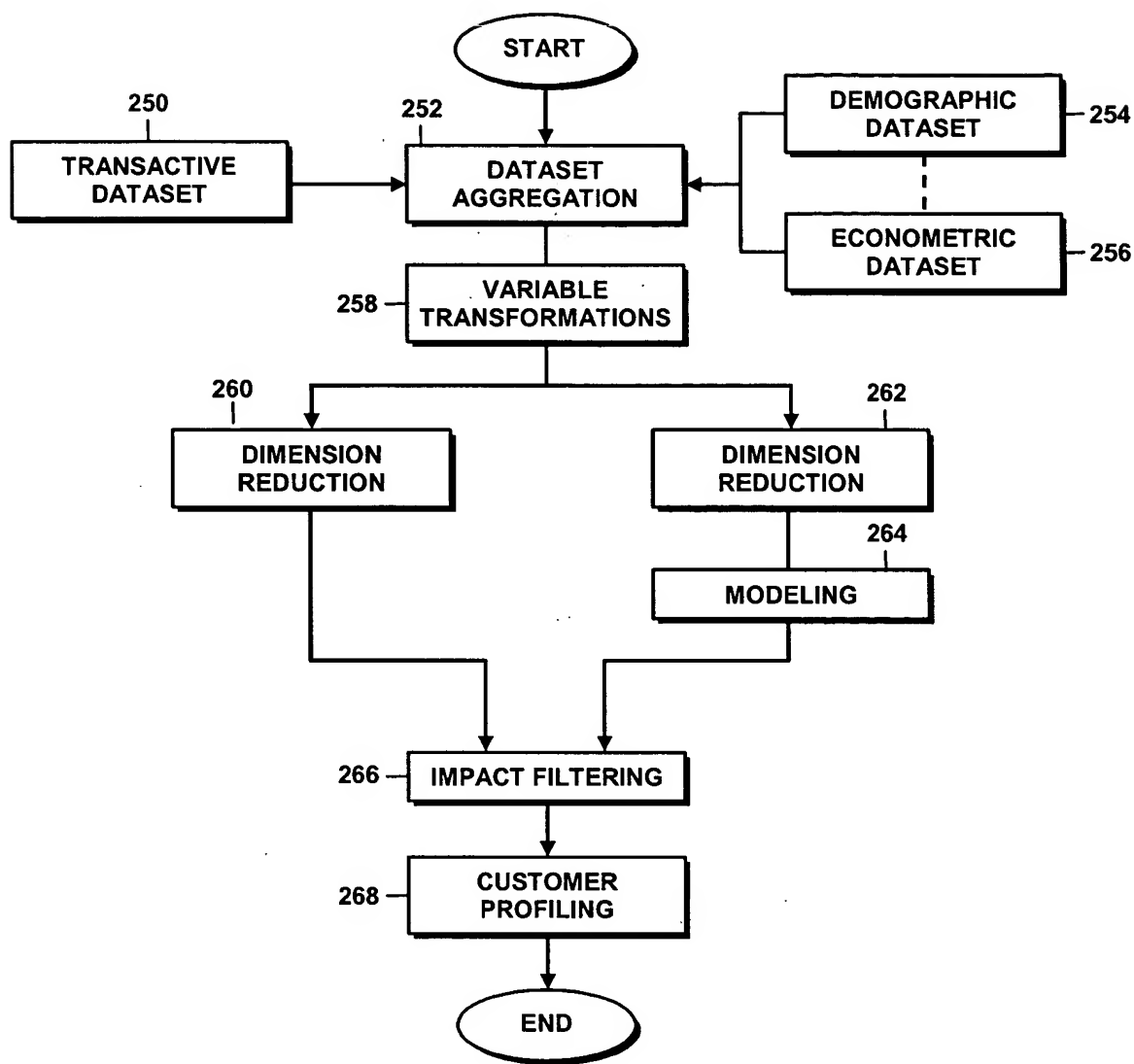


FIG. 11

**FIG. 12**

**FIG. 13**

**FIG. 14**

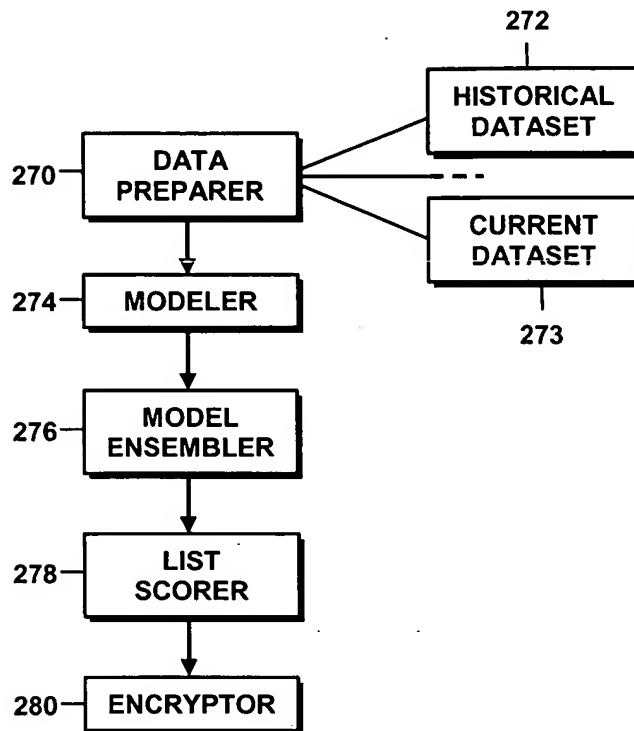


FIG. 15

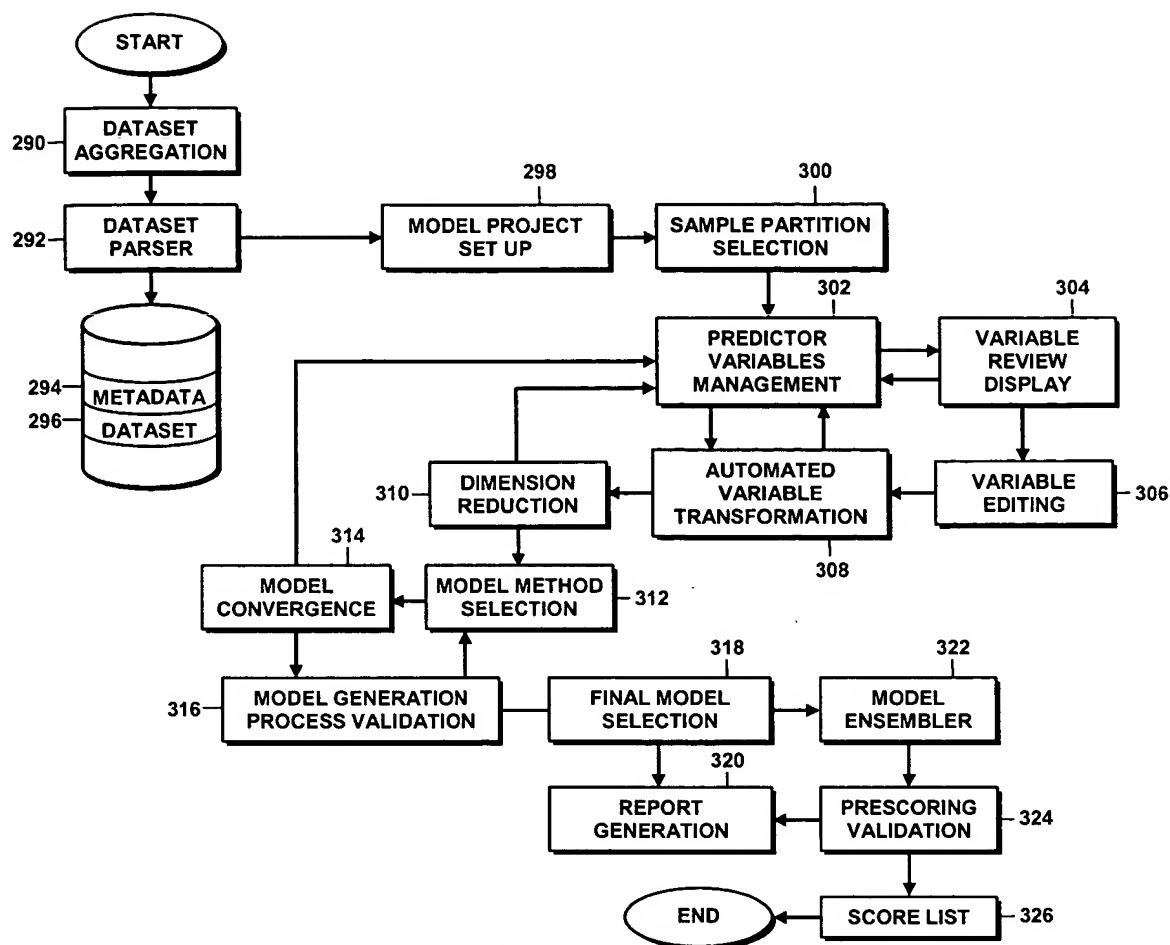


FIG. 16

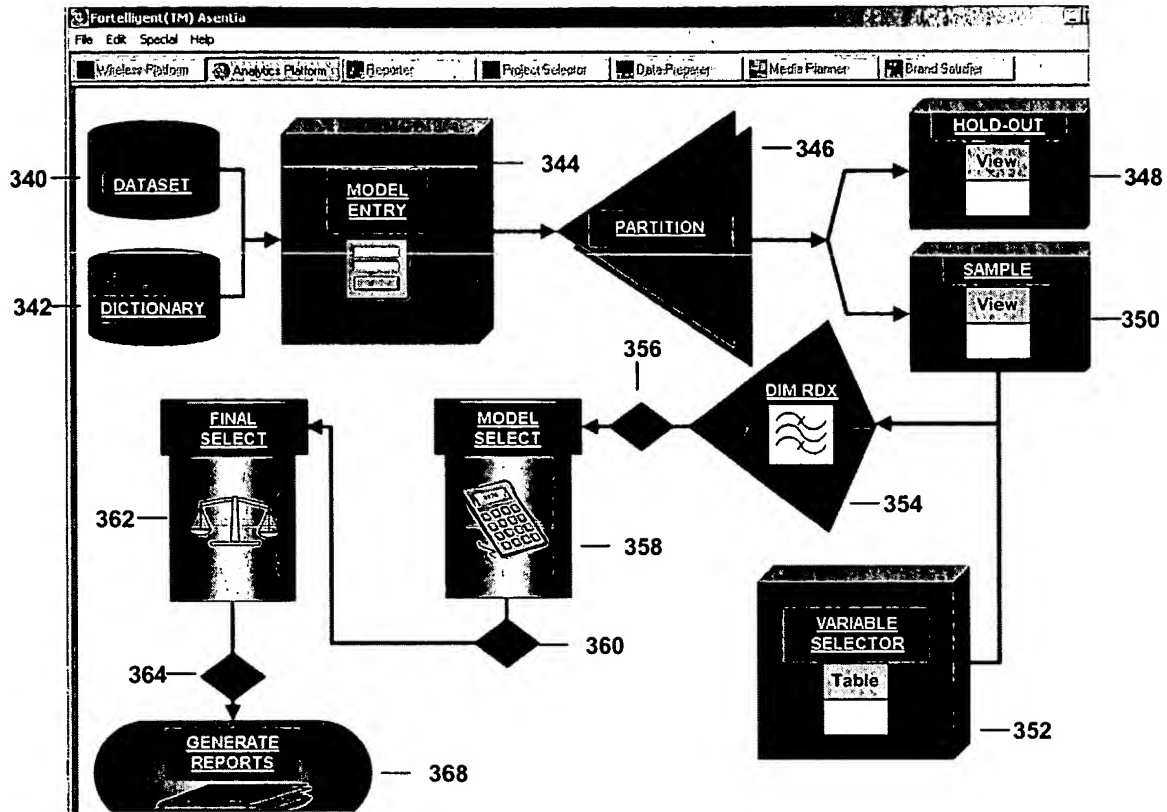


FIG. 17

Model Project Entry Form

Model Name: Model Type:

Model Project Goal or Scope:

370 Browse Datasource:

372 Browse Dictionary:

Dependent Variable (Y): 374

Candidate Model Properties

Success criterion (c >):

Success criterion (KS >):

Model Constraints

Penetration Depth (%):

☒ Monotone Lift Required

☒ Impute Missing Values

Model Regressor Variables

Variable	Variable Description
CustomerID	Identification Number for Customer
Current_purchase	Made a purchase in current campaign
Recent_purchase	Recently purchased
Recently_contacted	Contacted within last 8 months
Very_recently_contacted	Contacted within last 30 days
Prior_contact_before_purchase1	Contacted before purchase of first kind
Prior_contact_before_purchase2	Contacted before purchase of second kind
Prior_purchase1	Purchase of first kind in recent campaign
Prior_purchase2	Purchase of second kind in recent campaign
No_recent_purchase1	No purchase of first kind in recent campaign
Regional_group1	located in Zone 1

Submit 376

FIG. 18A

DataDictionary : Table				
Variable	Variable Type	Variable Description	Variable Definition	Status
CustomerID	N	Identification Number for Customer	CustomerID	XP
Current_purchase	N	Made a purchase in current campaign	Current_purchase	P
Recent_purchase	N	Recently purchased	Recent_purchase	P
Recently_contacted	N	Contacted within last 8 months	Recently_contacted	P
Very_recently_contacted	N	Contacted within last 30 days	Very_recently_contacted	P

FIG. 18B

Predictor Variables Palette

Excluded Constructed Variables

Predictor Variables

Excluded Primary Variables

Recent_purchase
Recently_contacted
Prior_contact_before_purchase
Prior_contact_before_purchase
Prior_purchase1
Prior_purchase2
No_recent_purchase1
Regional_group6

CustomerID
Current_purchase
Very_recently_contacted
Regional_group1
Regional_group2
Regional_group3
Regional_group4
Regional_group5

Variable Editor

Variable	Definition
Recent_purchase	Recent_purchase
Recently purchased	
Description	
Edit	Save
Clear	Log
	Square
	SQRT
	(X)
	1/(x+b)
Analyze Predictor Variables	Miss
	Optim
	Sum
	Spline
	Aggregate

☒ Interaction Tree: Buyers vs. Non-buyers

Reduce Dimensions

Reconsider Model

FIG. 19.

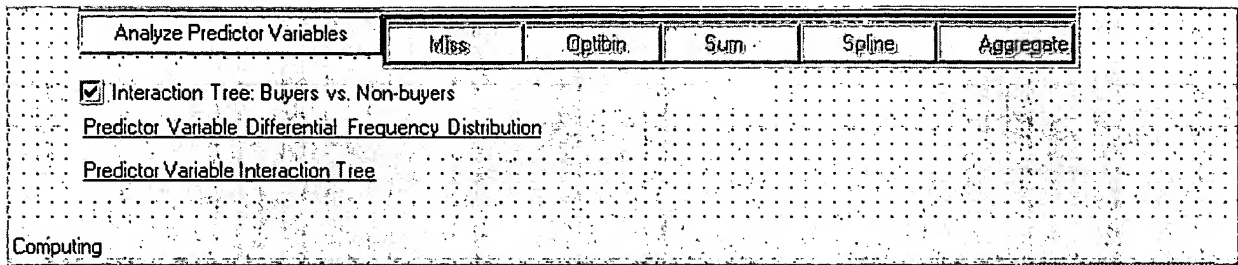


FIG. 20A

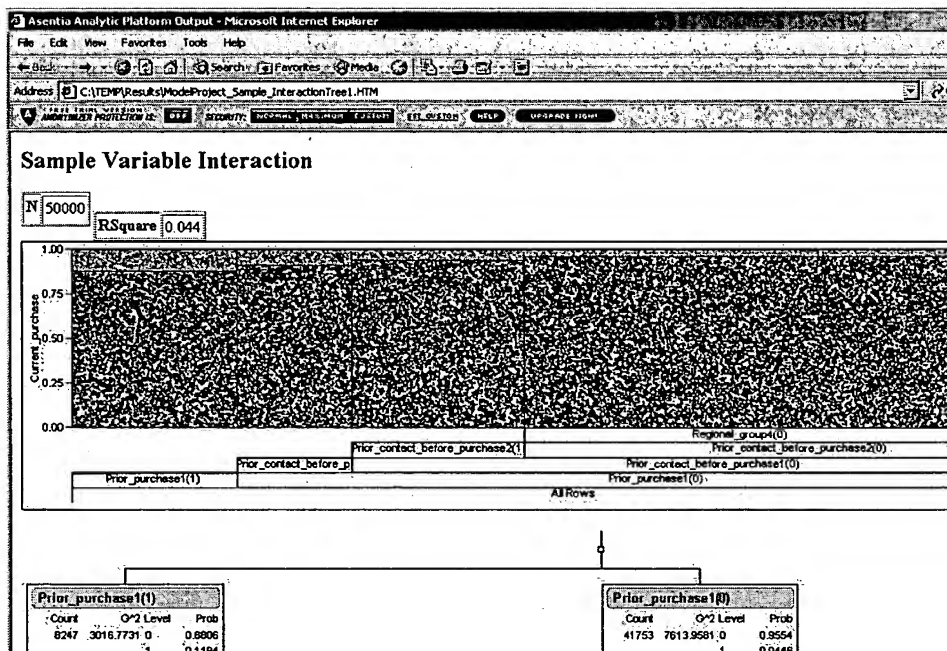


FIG. 20B

Variable Editor	
Variable	Definition
Recent_purchase	Recent_purchase
Description	
Recently purchased	
<div>Edit</div> <div>Save</div> <div>Clear</div>	<div>Log</div> <div>Square</div> <div>SQRT</div> <div>(X)</div> <div>If a ex...</div>
<div>Miss</div> <div>Optibin</div> <div>Sum</div>	

FIG. 21A

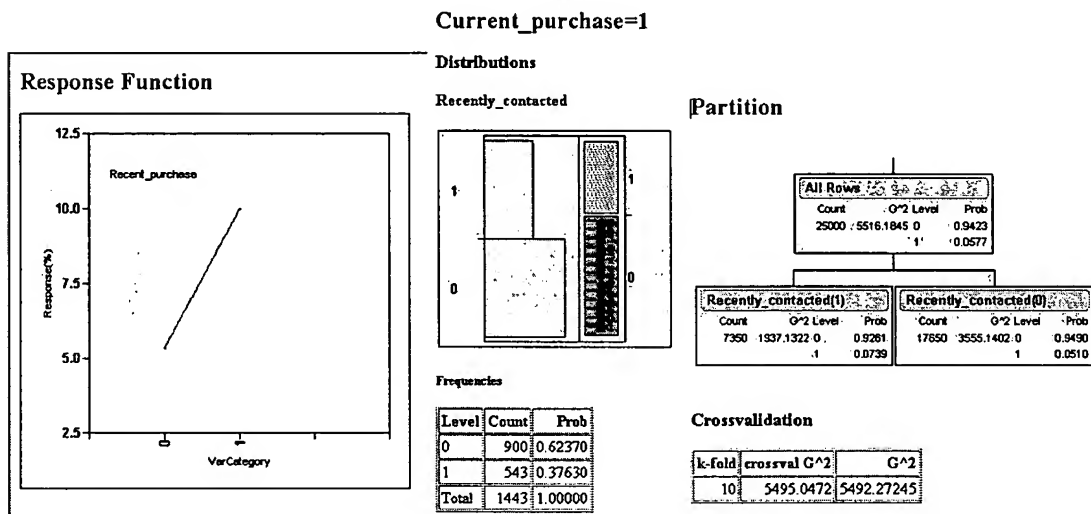


FIG. 21B

Variable Editor	
Variable	Definition
Prior_purchase1_1	Prior_purchase1*
Description	
Purchase of first kind in recent campaign	
<div>Edit</div> <div>Save</div> <div>Clear</div>	<div>Log</div> <div>Square</div> <div>SQRT</div> <div>(X)</div>

FIG. 21C

Variable Editor	
Variable	Definition
Prior_purchase1_1	Prior_purchase1 * Prior_contact_before_purchase1
Description	
Purchase of first kind in recent campaign AND Contacted before purchase of first kind	
<div> <div>Edit</div> <div>Save</div> <div>Clear</div> <div>Log</div> <div>Square</div> <div>SQRT</div> <div>(X)</div> </div>	

FIG. 21D

Variable Editor

Variable	Definition
Prior_purchase1_I	Prior_purchase1*Prior_contact_before_purchase1

Description:
Purchase of first kind in recent campaign AND Contacted before purchase of first kind

Buttons: Edit, Save, Clear, Log, Square, SQRT, OK

Buttons: Revisit Reduction, Cancel

FIG. 21E

Dimension Reduction Palette

Sparsely Populated Variables

☒ Exclude variables fewer observations less than (Default is 5%)

Forward Stepwise OLS $X_j, X_j^2, X_j \cdot X_k, X_j \cdot Z, (X_j + Z) \cdot Z$

☒ Set Cut-off for Main Effects (Default is 0.05)

☒ Set Cut-off for Non-linear Interaction (Default is 0.05)

☒ Set Cut-off for Summation (Default is 0.05)

☒ Set Cut-off for Summation (Default is 0.05)

Number of Predictor Variables reduced to: 12

Reduce

Advance to Modeling

Cancel

Review Predictors

FIG. 22

Applicant(s): Stephen K. Pinto et al.

DIMENSION REDUCTION IN PREDICTIVE MODEL
DEVELOPMENT

The image shows a software window titled "Model Selection Palette". It contains three main sections for different statistical methods. The first section, "Stepwise Logistic Regression", has a "Logit Regression Method" sub-section with radio buttons for "Maximum Likelihood" (selected) and "Ordinary Least Squares". To its right is a "Logit Regression Mode" sub-section with radio buttons for "Mixed" (selected), "Forward", and "Backward". Below these are two dropdown menus for "Significance Levels for Predictor Variable Status Change", both set to "0.30". The second section, "Stepwise Linear Discriminant Analysis (General Location Model)", has an "LDA Regression Assumptions" sub-section with checkboxes for "Equal Variances", "Box Test", and "Normal Distribution" (all unchecked). To its right is an "LDA Regression Mode" sub-section with radio buttons for "Mixed", "Forward", and "Backward" (all unchecked). Below these are two dropdown menus for "Significance Levels for Predictor Variable Status Change", both set to "0.30". The third section, "Test for Model Variable Persistence", is checked with a checkbox. Below it are two dropdown menus for "Significance Levels for Predictor Variable Status Change", set to "0.25" and "0.025" respectively.

Model Selection Palette

Methods

☐ Stepwise Logistic Regression

Logit Regression Method

☒ Maximum Likelihood

☐ Ordinary Least Squares

Logit Regression Mode

☒ Mixed

☐ Forward

☐ Backward

Significance Levels for Predictor Variable Status Change

Entry: 0.30 Retain: 0.30

☐ Stepwise Linear Discriminant Analysis (General Location Model)

LDA Regression Assumptions

☐ Equal Variances

☐ Box Test

☐ Normal Distribution

LDA Regression Mode

☐ Mixed

☐ Forward

☐ Backward

Significance Levels for Predictor Variable Status Change

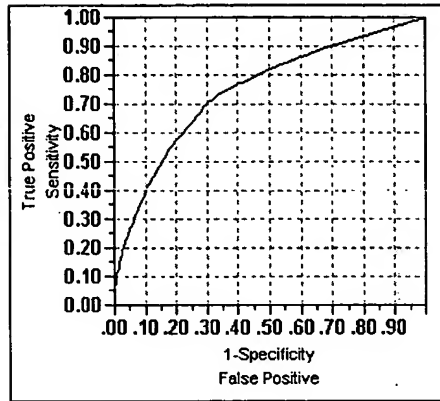
Entry: 0.30 Retain: 0.30

☒ Test for Model Variable Persistence

Significance Levels for Predictor Variable Status Change

Entry: 0.25 Retain: 0.025

FIG. 23A

Receiver Operating Characteristic

Using Current_Purchase='1' to be the positive level
Area Under Curve =
0.74906

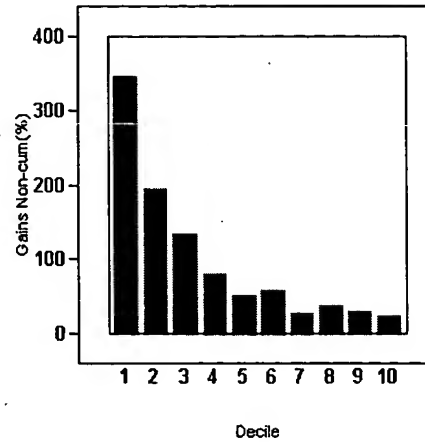
Model Gains for Sample

FIG. 23B

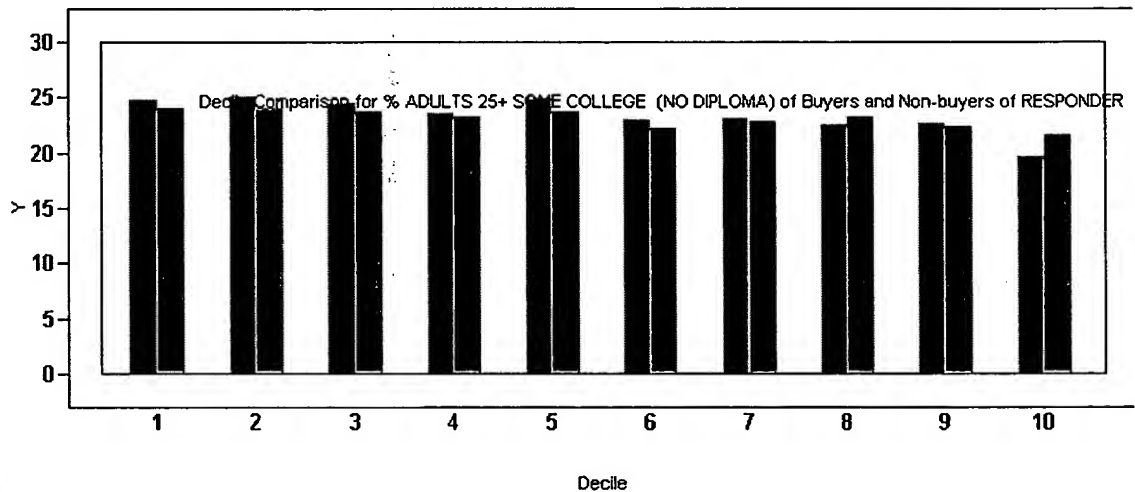
Persistence of Model for Key Predictor Variables

FIG. 23C

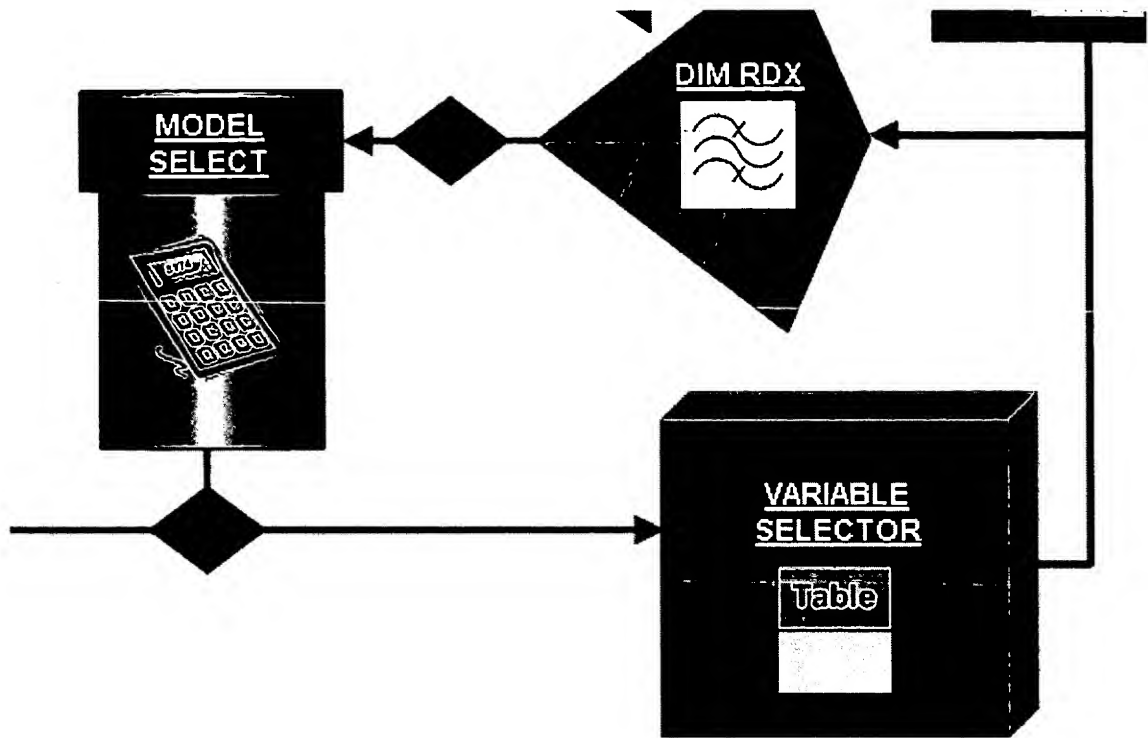


FIG. 24

Applicant(s): Stephen K. Pinto et al.

DIMENSION REDUCTION IN PREDICTIVE MODEL
DEVELOPMENT

Final Model Candidate Selection

Target Goals for Final Model

Model Project Target c-Statistic: 0.70
Model Project Target KS-Statistic: 0.25
Model Project Anticipated Penetration Depth: 40
Model Project Monotone Lift Expected: Yes

Select Validation Dataset

☐ Preselected Sample
☐ Preselected Sample Complement
☐ Full Development Dataset (100%)
☒ Random Sample (%) 0

☒ Model Statistics for Sample vs Validation
☒ Cumulative Lift of Model versus Baseline
☒ Non-Cumulative Lift of Model versus Baseline

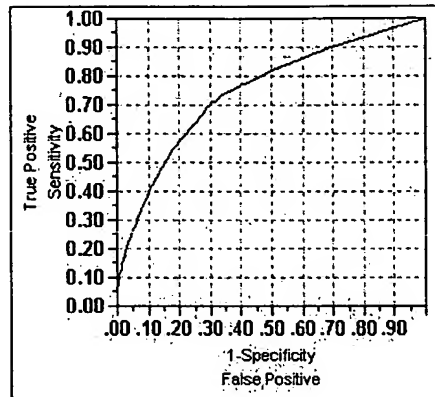
Validate Model
Finish Modeling
Reconsider Model
Review Predictors

FIG. 25A

Applicant(s): Stephen K. Pinto et al.

DIMENSION REDUCTION IN PREDICTIVE MODEL
DEVELOPMENT

Receiver Operating Characteristic



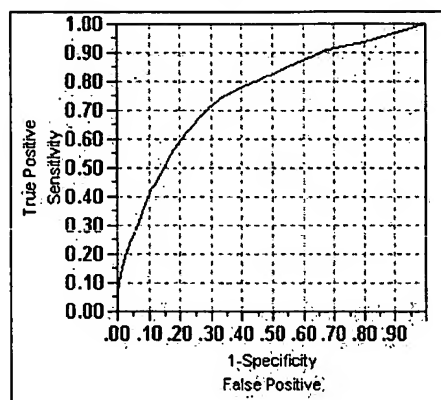
Using Current_Purchase='1' to be the positive level

Area Under Curve =

0.74906

FIG. 25B

Applicant(s): Stephen K. Pinto et al.

DIMENSION REDUCTION IN PREDICTIVE MODEL
DEVELOPMENT**Receiver Operating Characteristic**

Using Current_Purchase='1' to be the positive level
Area Under Curve =
0.75884

FIG. 25C

Applicant(s): Stephen K. Pinto et al.
DIMENSION REDUCTION IN PREDICTIVE MODEL
DEVELOPMENT



FIG. 26

Model Project Insight Form

Select Lowest Acceptable Match Rate (%) 60

☒ Target Profile Key Factors

☒ Target vs Non-target Profile Key Factors

Get Insight

PageSetup

Print Preview

Print

Cancel

FIG. 27A

Display Profile Key Factors

Display Target vs Non-target Key Factors

Print Preview

Print

Cancel

FIG. 27B

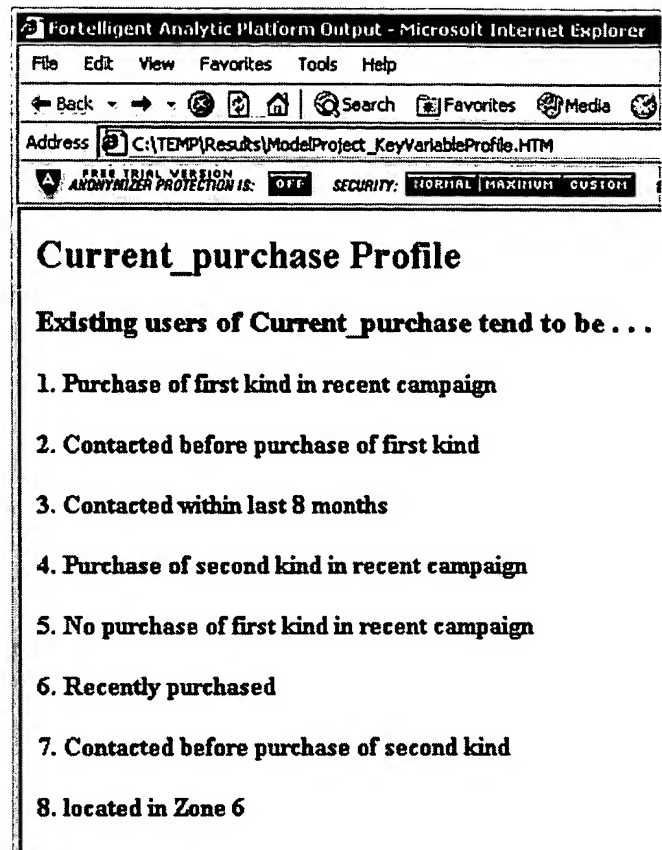


FIG. 27C

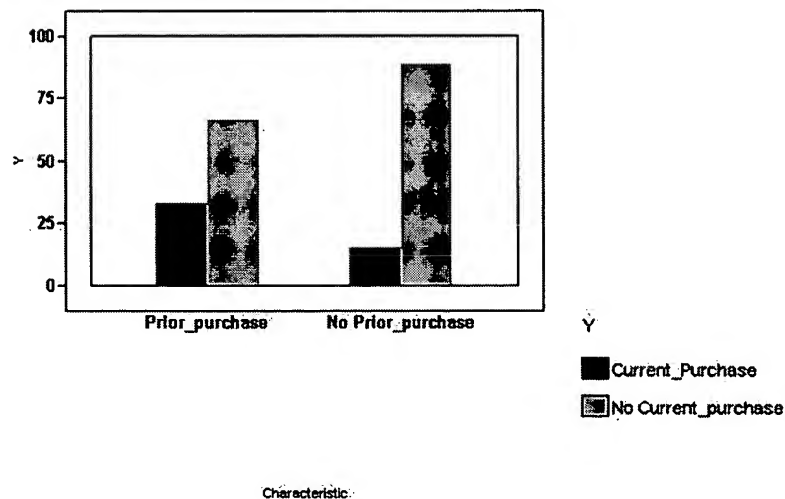


FIG. 27D